

T3/Oat tutorials

Tutorial 7: T3 and the Android Field Book

<https://triticeaetoolbox.org/oat/>



The Android Field Book

The Android Field Book program was created by the Poland lab (Kansas State University). The program can be downloaded from:

<http://www.wheatgenetics.org/bioinformatics/22-android-field-book.html>

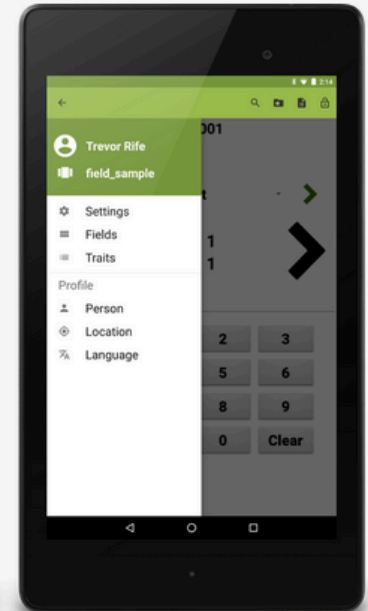
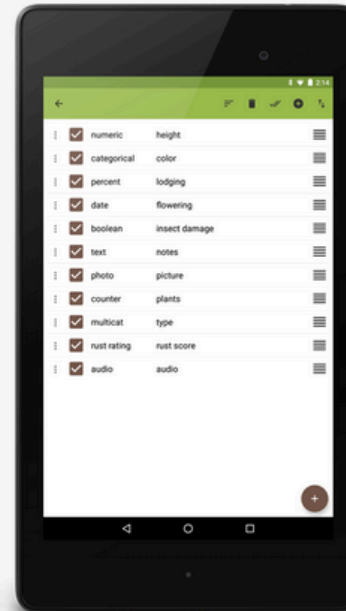
Field Book



Field Book is one of the apps developed for the **One Handheld Per Breeder** initiative. Field Book is a simple app that can be used by researchers to easily take notes on field research plots. Other digital note-taking tools are often complex

spreadsheet applications that don't allow for fast and flexible data entry or are created for proprietary and expensive hardware which is inaccessible for many research groups.

Using open-source software and relatively inexpensive phone and tablet hardware, we have created a platform that will allow researchers to replace hard-copy field books, thus alleviating the possibility of transcription errors. Creating this system also allows useful and modern technology to be used in environments where cost and inflexibility have been limiting factors.



T3 and the Android Field Book

T3 provides a series of tools that interface with the Android Field Book (AFB) program:

- T3 tools can be used to generate
 - A field layout file
 - A phenotypic trait file

These two files are required to begin recording measurements using the AFB

- Trial results recorded in the AFB can be uploaded directly to T3



T3 and the Android Field Book app

How to begin recording results using the AFB and T3:

1. Create a trial in T3 (or use an existing T3 trial)
2. Create a field layout for the T3 trial
3. Download a field layout from T3 in the AFB format
4. Download a file of T3 traits in the AFB format
5. Import the field layout and trait file to the AFB app
6. Begin recording results using your tablet



Tutorial 7: Outline

1. The “Manage Phenotype Trials” tool
 1. Creating and uploading a new T3 trial
 2. Creating a T3 field layout
 3. Uploading a T3 field layout to the T3/Oat Sandbox
2. Downloading AFB files from the T3/Oat Sandbox
3. Importing files to the AFB
4. Recording measurements in the AFB
5. Exporting trial results from the AFB
6. Uploading AFB trial results to the T3/Oat Sandbox
7. Submitting the AFB trial to T3/Oat



Section 1: The “Manage Phenotype Trials” tool

- Navigate to the T3/Oat homepage at <https://triticeaetoolbox.org/oat/>
- The “Manage Phenotype Trials” tool can be used to:
 - Create a new T3 trial
 - Create a field layout for a new or an existing T3 trial

T3/Oat [Contact Us](#)

Home Select ▾ Analyze ▾ Download ▾ Manage ▾ About T3 ▾

Phenotype Trials

Quick Links
[Login/Register](#)

Current selections:
[Lines: 0](#)
[Markers: All](#)
[Traits: 0](#)
[Phenotype Trials](#)
[Genotype Experiments](#)

Quick search...

Home: T3/Oat

Welcome to T3/Oat!

T3/Oat is the repository of oat phenotype and genotype data for the Global Oat Genetics Database, a project initiated in January 2014 by

- Gabe Gusmini (PepsiCo)
- Joe Lutz (General Mills)
- Bruce Roskens (Grain Millers)
- Nicholas Tinker (AAFC)
- Kay Simmons, Jack Okamuro, Jose Costa, Jean-Luc Jannink, and Gerard Lazo (USDA-ARS)

For more information see the [Oat Global](#) website.

What's New

Section 1.1: Creating and uploading a new T3 trial

It is necessary to provide trial information before a field layout can be generated using T3 tools. This trial information is not used by the AFB app.

To create a new T3 trial using the “Manage Phenotype Trials” tool:

- First select the set of lines in the trial using one of the line selection tools
- Then navigate to the Manage menu> Phenotype Trials

T3/Oat [Contact Us](#)

Home Select ▾ Analyze ▾ Download ▾ Manage ▾ About T3 ▾

Phenotype Trials

Quick Links
[Login/Register](#)
Current selections:
[Lines: 20](#)
[Markers: All](#)
[Traits: 0](#)
[Phenotype Trials](#)
[Genotype Experiments](#)

Home: T3/Oat

Welcome to T3/Oat!

T3/Oat is the repository of oat phenotype and genotype data for the Global Oat Genetics Database, a project initiated in January 2014 by

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For more information see the [Oat Global](#) website.

Section 1.1: Creating and uploading a new T3 trial

Manage Phenotype trials

This tool allows you to view a trial, create a trial, or create an experiment design.

The results can be uploaded in the sandbox, downloaded to a tablet device, or submitted to the curator for loading into the production website.

- ☐ Select existing trial
☒ Create new trial

The trial design is generated by the agricolae package except for the Mod. Aug. Design type which uses a custom R script.
To create an experiment design, select a design type from the drop-down list

Program:	<input type="text" value="select program"/>	Program responsible for data collection
Trial Name:	<input type="text"/>	Format: "Experiment_YYYY_Location", where Experiment is short but descriptive, YYYY=Trial Year. Trial Names should be unique across T3 for a crop. A trial is carried out at one location in one year.
Year:	<input type="text" value="2015"/>	
Location:	<input type="text" value="select location"/>	
Experiment Name:	<input type="text"/>	Optional. The experiment is one hierarchical level above the trial. An experiment may have several trials with similar or identical entry lists
Latitude of field:	<input type="text"/>	Decimal Degrees format, without a degree symbol, e.g. "47.824". There is a converter at http://boulter.com/gps/ . GPS coordinates can be found by address at http://touchmap.com/latlong.html .
Longitude of field:	<input type="text"/>	
Collaborator:	<input type="text"/>	Name of principal scientist.
Trial description:	<input type="text"/>	
Planting date:	<input type="text"/>	This should be the one date on which planting was begun. Use Excel "Text", not "Date", format. The value should be given as m/d/yyyy with no leading zeros, e.g. "5/7/2012".
Harvest date:	<input type="text"/>	Use Excel "Text", not "Date", format. If the trial was not harvested, use the date of last data collection.
Begin weather date:	<input type="text"/>	Optional, if T3 should store weather data starting at some point before planting (e.g., to track soil moisture status).
Greenhouse trial	<input checked="" type="radio"/> No <input type="radio"/> Yes	
Seeding rate	<input type="text"/>	This is the target density for the trial, not the actual rate for each line
Design type:	<input type="text" value="select design"/>	
Irrigation	<input checked="" type="radio"/> No <input type="radio"/> Yes	
Other remarks	<input type="text"/>	Optional. Adjustments to means in data analysis or other specifics of statistical analysis. Other notes that may help in interpretation of results, for example that harvest was delayed due to weather.
<input type="button" value="Create trial"/>		

To create a new T3 trial:

1. Select "Create new trial" at the top of the page
2. Fill out the form
 - Please contact the curator if you do not see the value that you require in a drop-down menu

- * If you select an experimental design then you can create and download a field layout at this stage (see section 1.2)
3. Click "Create trial"
4. Download the trial description
5. Upload the trial description to the T3/Oat Sandbox at <https://t3sandbox.org/t3/sandbox/oat/>

Section 1.1: Creating and uploading a new T3 trial

- The trial description file generated by the “Manage Phenotype Trials” tool is in the format required for upload to T3
- Alternatively, a trial description template (below) can be used to upload trial information for one or more trials, or to edit existing trial information
 - The template is available from the Data Submission page in the About T3 menu
- See T3 Tutorial 3 for help loading trial information to the T3/Oat Sandbox (<https://t3sandbox.org/t3/sandbox/oat/>)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Trial Submission Form														
2	Template version	4Dec12													
3	Crop	oat													
4	Breeding Program Code	CDC-D													
5		TRIAL #1	TRIAL #2												
6	Trial Name	UEOPN_2015_Saskatoon	UEOPN_2014_Saskatoon												
7	Trial Year	2015	2014												
8	Experiment Name	Uniform Early Oat Perform	Uniform Early Oat Performance Nursery												
9	Location	Saskatoon, SK-CAN	Saskatoon, SK-CAN												
10	Latitude of field	52.153467	52.146691												
11	Longitude of field	-106.528719	-106.540644												
12	Collaborator	Aaron D. Beattie	Aaron D. Beattie												
13	Trial description														
14	Planting date	5/18/2015	5/17/2014												
15	Harvest date	9/21/2015	9/1/2014												
16	Begin weather date														
17	Greenhouse trial? (yes or no)	no	no												
18	Seeding rate (seeds/m ²)	254	254												
19	Experimental design	RCBD	RCBD												
20	Number of entries	24	23												
21	Number of replications	3	3												

Notes

Row headings with a green background show the required fields. Required fields also have an asterisk (*) in these notes.

***Breeding Program Code:** Program responsible for data collection. Codes can be found under the About T3 menu> Contributing data programs. Data program codes are located in the second table under the heading 'Data programs' and consist of a 3-letter code followed by "-D". All of the trials loaded in the same Trial Submission document must have the same breeding program code.

***Trial Name:** Format is "Experiment_YYYY_Location". You are free to choose an experiment name, which should be short but descriptive, and can be used as an additional method of linking trials together later in the form. YYYY= trial year; for winter trials that are planted and harvested in different calendar years please use the year that the trial was harvested. Location= specific location of the trial, usually a nearby settlement. The trial name in its entirety should be unique.

***Trial Year:** Year in which the trial was or would have been harvested.

Experiment Name: Experiment is one hierarchical level above trial and can be used to link trials in T3/Oat. The drop down menu "Search Trials by Experiment" on the T3/Oat homepage can be used to view existing experiments. Experiment name should be self-explanatory but it can be coded when used as part of a trial name (see examples in this template).

***Location:** Format for USA and Canada is <city/town>, <2 letter state/province abbreviation> followed by "-CAN" or "-USA". Format for trials conducted in other countries is <city/town>, <country>.

***Latitude and Longitude of field:** Decimal degrees format without a degree symbol. There is a

Section 1.2: Creating a T3 field layout

Manage Phenotype trials

This tool allows you to view a trial, create a trial, or create an experiment design. The results can be uploaded in the sandbox, downloaded to a tablet device, or submitted to the curator for loading into the production website.

- ☐ Select existing trial
☒ Create new trial

The trial design is generated by the agricolae package except for the Mod. Aug. Design type which uses a custom R script. To create an experiment design, select a design type from the drop-down list

Program:	<input type="text" value="select program"/>	Program responsible for data collection
Trial Name:	<input type="text"/>	Format: "Experiment_YYYY_Location", where Experiment is short but descriptive, YYYY=Trial Year. Trial Names should be unique across T3 for a crop. A trial is carried out at one location in one year.
Year:	<input type="text" value="2015"/>	
Location:	<input type="text" value="select location"/>	
Experiment Name:	<input type="text"/>	Optional. The experiment is one hierarchical level above the trial. An experiment may have several trials with similar or identical entry lists
Latitude of field:	<input type="text"/>	Decimal Degrees format, without a degree symbol, e.g. "47.824". There is a converter at http://boulter.com/gps/ .
Longitude of field:	<input type="text"/>	GPS coordinates can be found by address at http://touchmap.com/latlong.html .
Collaborator:	<input type="text"/>	Name of principal scientist.
Trial description:	<input type="text"/>	
Planting date:	<input type="text"/>	This should be the one date on which planting was begun. Use Excel "Text", not "Date", format. The value should be given as m/d/yyyy with no leading zeros, e.g. "5/7/2012".
Harvest date:	<input type="text"/>	Use Excel "Text", not "Date", format. If the trial was not harvested, use the date of last data collection.
Begin weather date:	<input type="text"/>	Optional, if T3 should store weather data starting at some point before planting (e.g., to track soil moisture status).
Greenhouse trial	<input checked="" type="radio"/> No <input type="radio"/> Yes	
Seeding rate	<input type="text"/>	This is the target density for the trial, not the actual rate for each line
Design type:	<input type="text" value="select design"/>	
Irrigation	<input checked="" type="radio"/> No <input type="radio"/> Yes	
Other remarks	<input type="text"/>	Optional. Adjustments to means in data analysis or other specifics of statistical analysis. Other notes that may help in interpretation of results, for example that harvest was delayed due to weather.

Create trial

Field layout

Treatment:	30 lines selected
Replications or Blocks:	<input type="text"/> greater than or equal to 2
<input type="button" value="Create field layout"/>	

A field layout for a new T3 trial can be created at the same time as the trial description (see section 1.1) using the “Manage Phenotype Trials” tool.

1. Select an experimental design
2. Depending on the design selection you will be prompted to specify:
 - The number of replicates
 - The block size
 - The checks
3. Click “Create field layout”
4. Download the field layout

The field layout for a new T3 trial will use the lines in the “current selections”.

Section 1.2: Creating a T3 field layout

Manage Phenotype trials

This tool allows you to view a trial, create a trial, or create an experiment design. The results can be uploaded in the sandbox, downloaded to a tablet device, or submitted to the curator for loading into the production website.

- ☒ Select existing trial
☐ Create new trial

To create an experiment design, select a design type from the drop-down list

Program: AAFC Ottawa: data (OTW-D)

Trial Name: UMOPN_2015_Ottawa

Year: 2015

Location: Ottawa, ON-CAN

Experiment Name: Uniform Midseason Oat Performance Nursery

Latitude of field:

Longitude of field:

Collaborator: Weikai Yan

Trial description:

Planting date: 2015-05-05

Greenhouse trial? no

Seeding rate:

Design type: Random Complete Block

Irrigation:

Other remarks: The growing season was somewhat normal before heading and slightly drier than normal after the start of grain-filling. There was no lodging at all although the plant height was about normal. Stem breaking did occur after maturity for early varieties. The previous two crops were white clover and soybean, and the soil was clay-loam. N was applied pre-seeding at 25 lb per hectare; Buctril M was the herbicide sprayed at the 4-leaf stage. Crown rust was moderate with the really susceptible varieties heavily infested. Grain yield was originally recorded in bu/a and the original data is available in the supplementary raw data file. Plant height was originally recorded in inches and the original data is available in the supplementary data file. Test weight was originally recorded in lb/bu and the original data is available in the supplementary raw data file.

Field layout

Treatment: 30 lines selected

Replications or Blocks: greater than or equal to 2

Create field layout

To create a field layout for an existing T3 trial:

1. Choose “Select existing trial” at the top of the page
2. Select the breeding program responsible
3. Select the trial name
4. Choose an experimental design
5. Depending on the design selection you will be prompted to specify:
 - The number of replicates
 - The block size
 - The checks
6. Click “Create field layout”
7. Download the field layout

The field layout for an existing T3 trial will use the lines in the “current selections”, unless the trial already has trial results stored in T3.

Section 1.2: Creating a T3 field layout

- The field layout file generated by the “Manage Phenotype Trials” tool is in the format required for upload to T3
 - This is not the same as the Android Field Book format
- Alternatively, the Fieldbook template (below) can be used to upload a field layout
 - The template is available from the Data Submission page in the About T3 menu
- **It is necessary to supplement the information held in a field layout generated using the “Manage Phenotype Trials” tool before uploading it to T3**
 - The “row” and “column” fields are required but are not filled in by the T3 tool
 - Please follow the instructions in the Fieldbook template if you wish to fill in the remaining optional fields

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	plot	trial	line_name	row	column	entry	replication	block	subplot	treatment	block_tmt	subplot_tmt	check	Field_ID	note		Mandatory fields are in trial (valid T3 trial name) the field template. Ther plot (numeric) [MANDA separate rows. This mea line_name (valid T3 line template file. The value row (numeric): One dim spatial variation along th of the planter while it is column (numeric): The v control for spatial variat movement of the plant entry (numeric): entry n replication (numeric): If the trial are grouped tog block (numeric): If prese seek to control for varia subplot (numeric): If p trial are grouped toget treatment (alphanumeric might have different tre main_plot_tmt (alphab have the same level fo blocks). subplot_tmt (alphan check (0 or 1): 0 means
2		1 NUE_2012_MEAD	SETTLER_CL	1	1	302	1	1	1		LOW_N			1 MEAD12_1			
3		2 NUE_2012_MEAD	TRIUMPH64	1	2	1	1	1	1		LOW_N			0 MEAD12_1			
4		3 NUE_2012_MEAD	CHISHOLM	1	3	2	1	1	1		LOW_N			0 MEAD12_1			
5		4 NUE_2012_MEAD	CENTURY	1	4	3	1	1	1		LOW_N			0 MEAD12_1			
6		5 NUE_2012_MEAD	CUSTER	1	5	4	1	1	1		LOW_N			0 MEAD12_1			
7		6 NUE_2012_MEAD	2174-05	1	6	5	1	1	1		LOW_N			0 MEAD12_1			
8		7 NUE_2012_MEAD	INTRADA	1	7	6	1	1	1		LOW_N			0 MEAD12_1			
9		8 NUE_2012_MEAD	OK101	1	8	7	1	1	1		LOW_N			0 MEAD12_1			
10		9 NUE_2012_MEAD	OK102	1	9	8	1	1	1		LOW_N			0 MEAD12_1			
11		10 NUE_2012_MEAD	ENDURANCE	1	10	9	1	1	1		LOW_N			0 MEAD12_1			
12		11 NUE_2012_MEAD	DELIVER	1	11	10	1	1	1		LOW_N			0 MEAD12_1			
13		12 NUE_2012_MEAD	OK_BULLET	1	12	11	1	1	1		LOW_N			0 MEAD12_1			
14		13 NUE_2012_MEAD	CENTERFIELD	1	13	12	1	1	1		LOW_N			0 MEAD12_1			
15		14 NUE_2012_MEAD	GUYMON	1	14	13	1	1	1		LOW_N			0 MEAD12_1			
16		15 NUE_2012_MEAD	DUSTER	1	15	14	1	1	1		LOW_N			0 MEAD12_1			
17		16 NUE_2012_MEAD	JAGGER	1	16	301	1	1	1		LOW_N			1 MEAD12_1			
18		17 NUE_2012_MEAD	OK_RISING	1	17	15	1	1	1		LOW_N			0 MEAD12_1			
19		18 NUE_2012_MEAD	OK02405	1	18	16	1	1	1		LOW_N			0 MEAD12_1			
20		19 NUE_2012_MEAD	PETE	1	19	17	1	1	1		LOW_N			0 MEAD12_1			
21		20 NUE_2012_MEAD	BILLINGS	1	20	18	1	1	1		LOW_N			0 MEAD12_1			
22		21 NUE_2012_MEAD	OK04505	1	21	19	1	1	1		LOW_N			0 MEAD12_1			
23		22 NUE_2012_MEAD	OK04525	1	22	20	1	1	1		LOW_N			0 MEAD12_1			
24		221 NUE_2012_MEAD	SETTLER_CL	1	23	302	1	1	11		LOW_N			1 MEAD12_1			

Section 1.3: Uploading a T3 field layout to the T3/Oat Sandbox

- Navigate to the T3/Oat Sandbox at <https://t3sandbox.org/t3/sandbox/oat/>
- The curation menu will appear once you register and login
- Choose the Curate menu> Phenotype Trials

The screenshot shows the T3/Oat Sandbox website. The header is olive green with the site name 'T3/Oat Sandbox' on the left and a 'Contact Us' link on the right. A navigation bar below the header contains links: Home, Select, Analyze, Download, Curate, and About T3. The 'Curate' link is active, and a dropdown menu is open, listing options: Lines, Pedigrees, Phenotype Trials (highlighted), Phenotype Results, CSR Data, Delete Trials and Experiments, Traits and Genetic Characters, Genotype Experiments, Genotype Results, Maps, and Markers. On the left side, there is a 'Quick Links' section with 'Current selections:' and links for Lines, Markers, Traits, Phenotype Trials, and Genotype Experiments. Below this is a 'What's New' section. The main content area on the right has a 'Home: T3/Oat' heading and a 'Welcome to' message, followed by a list of names and a paragraph about the Global Oat Genetics Database.

T3/Oat Sandbox [Contact Us](#)

Home Select ▾ Analyze ▾ Download ▾ **Curate ▾** About T3 ▾

Quick Links

Current selections:

- [Lines: 0](#)
- [Markers: All](#)
- [Traits: 0](#)
- [Phenotype Trials](#)
- [Genotype Experiments](#)

Quick search...

What's New

Home: T3/Oat

Welcome to

T3/Oat is the repository for oat data for the Global Oat Genetics Database, a project initiated in January 2014 by

- Gabe Gusmini
- Joe Lutz (Genetics)
- Bruce Roskens
- Nicholas Tinker
- Kay Simmons, and

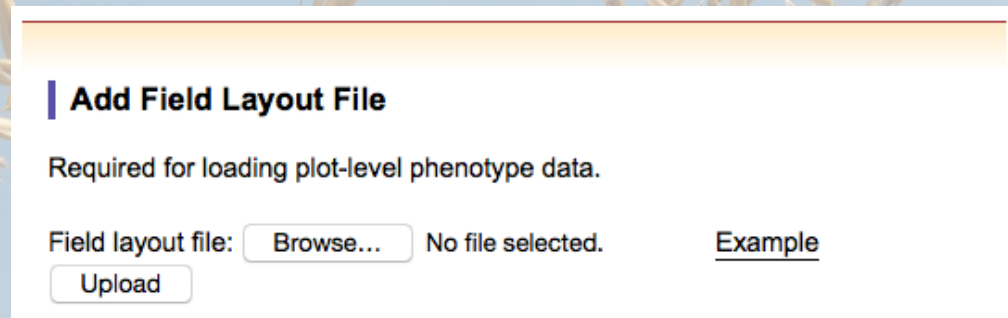
For more information, please contact the T3/Oat team.

Jannink, and Gerard Lazo (USDA-ARS)

T3/Oat is built upon the T3/Oat platform, which was developed for The Triticeae Toolbox (T3). T3 is the web portal for wheat and barley data.

Section 1.3: Uploading a T3 field layout to the T3/Oat Sandbox

The sandbox allows you to test load your template. The T3/Oat Sandbox reverts to an exact copy of T3/Oat overnight.



The screenshot shows a web interface for uploading a field layout file. It has a title 'Add Field Layout File' with a blue vertical bar to its left. Below the title is a subtitle 'Required for loading plot-level phenotype data.' The main section contains the text 'Field layout file:' followed by a 'Browse...' button, the text 'No file selected.', and an 'Upload' button. To the right of these elements is a link labeled 'Example'.

Add Field Layout File

Required for loading plot-level phenotype data.

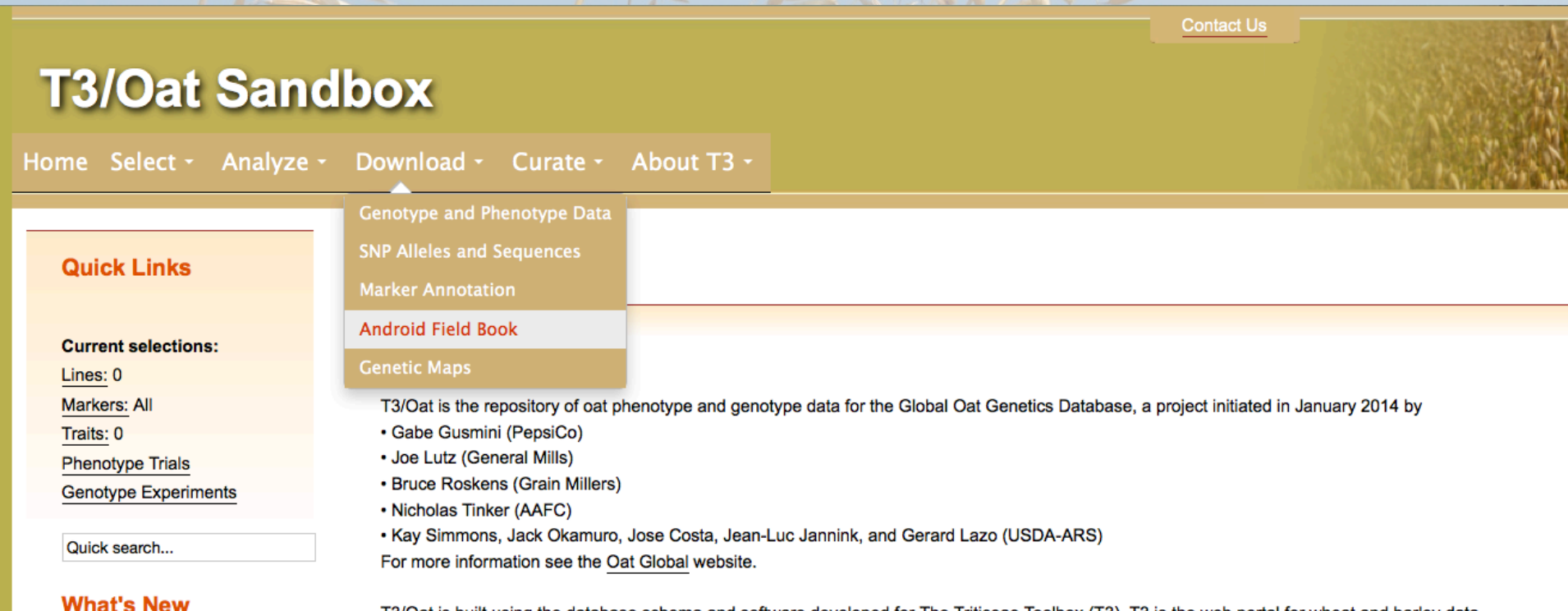
Field layout file: No file selected. [Example](#)

Browse for and upload the field layout file, created using either:

- The “Manage Phenotype Trials” tool
- The field layout template

Section 2: Downloading Android Field Book files from the T3/Oat Sandbox

- You should now have loaded a trial description and a field layout to the T3/Oat Sandbox
 - If you have not yet submitted these files to the production version of T3/Oat then the next step should be carried out in the T3/Oat Sandbox
- Choose the Download menu> Android Field Book



The screenshot shows the T3/Oat Sandbox website. At the top right is a 'Contact Us' link. The main header 'T3/Oat Sandbox' is on the left. Below it is a navigation bar with links: Home, Select, Analyze, Download, Curate, and About T3. The 'Download' menu is open, showing options: Genotype and Phenotype Data, SNP Alleles and Sequences, Marker Annotation, Android Field Book (highlighted), and Genetic Maps. On the left side, there is a 'Quick Links' section with 'Current selections:' and links for Lines, Markers, Traits, Phenotype Trials, and Genotype Experiments. Below this is a 'Quick search...' input field. On the right, a text block describes T3/Oat as a repository for oat phenotype and genotype data, listing contributors like Gabe Gusmini, Joe Lutz, Bruce Roskens, Nicholas Tinker, Kay Simmons, Jack Okamuro, Jose Costa, Jean-Luc Jannink, and Gerard Lazo. It also mentions 'The Oat Global website' for more information.

[Contact Us](#)

T3/Oat Sandbox

Home Select ▾ Analyze ▾ Download ▾ Curate ▾ About T3 ▾

Quick Links

Current selections:

[Lines: 0](#)

[Markers: All](#)

[Traits: 0](#)

[Phenotype Trials](#)

[Genotype Experiments](#)

Quick search...

Genotype and Phenotype Data

SNP Alleles and Sequences

Marker Annotation

Android Field Book

Genetic Maps

T3/Oat is the repository of oat phenotype and genotype data for the Global Oat Genetics Database, a project initiated in January 2014 by

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For more information see the [Oat Global](#) website.

T3/Oat is built using the database schema and software developed for The Triticeae Toolbox (T2). T3 is the web portal for wheat and barley data.

Section 2: Downloading Android Field Book files from the T3/Oat Sandbox

Download field layout and trait definition for Android Field Book

These tools provide a interface to the Android Field Book program created by the [Poland Lab](#). Before using these tools it is necessary to import a field layout into the database. In the Field Book program the range is the first level division and refers to the row of the field. The second level division is the plot. All other columns are considered Extra Information. The program moves through the field row by row for measurements.

Create Field Layout and Trait File for import into the tablet

1. Select a field layout for your experiment. Download and save the file.
2. Select a category and one or more traits. Download and save the file.
3. Connect your tablet to this computer.
4. Move the field layout file to the field_import folder of the SD card of the tablet.
5. Move the trait file to the trait folder of the SD card of the tablet.
6. Import these files into the Field Book App.
7. Record measurements using the tablet.

The screenshot displays the web interface for downloading field layout and trait files. It features a sidebar with a 'Field layout:' section containing a 'select a fieldbook' dropdown menu and a 'Category' section with a list of categories: Abiotic stress, Agronomic, Biotic stress, End use, Morphological, and Quality. The main content area has a 'Field layout:' section with a dropdown menu showing 'UMOPN_2015_Saskatoon' and a 'Download' button. Below this is a table with two columns: 'Category' and 'Traits'. The 'Category' column lists the same categories as the sidebar. The 'Traits' column lists various traits: heading date, lodging incidence, grain yield, plant height, maturity date, groat content, lodging severity, snapback, and relative canopy development. A 'Download' button is located to the right of the table.

Category	Traits
Abiotic stress	heading date
Agronomic	lodging incidence
Biotic stress	grain yield
End use	plant height
Morphological	maturity date
Quality	groat content
	lodging severity
	snapback
	relative canopy development

Select the required field layout from the drop-down menu.

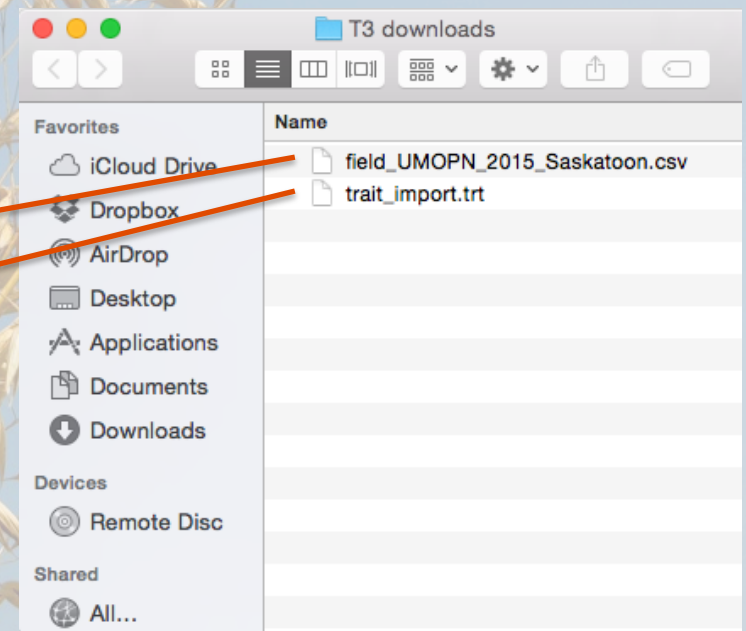
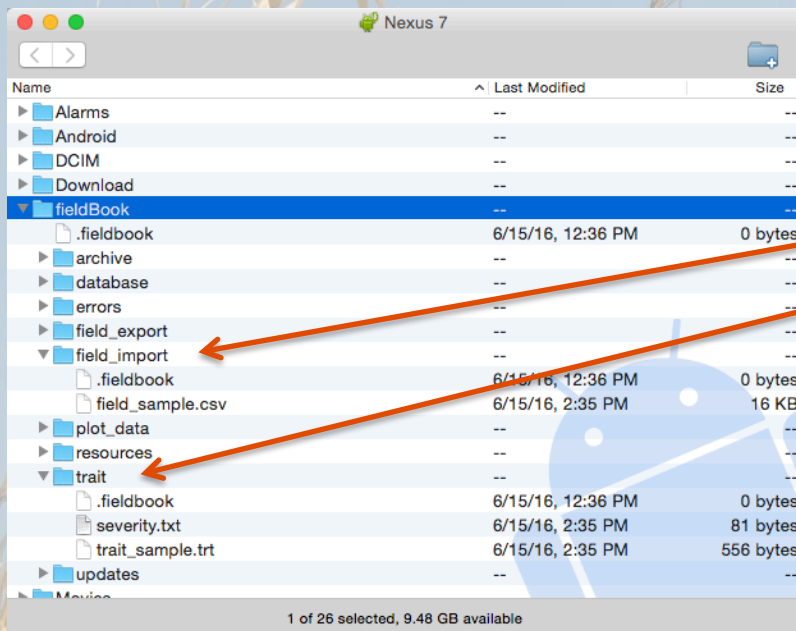
To download T3 traits:

1. Choose a trait category
2. Select one or more traits
 - Hold Ctrl (PC) or ⌘ (Mac)
3. Click “Download”

Navigate to the About T3 menu> Trait Descriptions for more details about the traits available in T3/Oat.

Section 3: Importing files to the Android Field Book

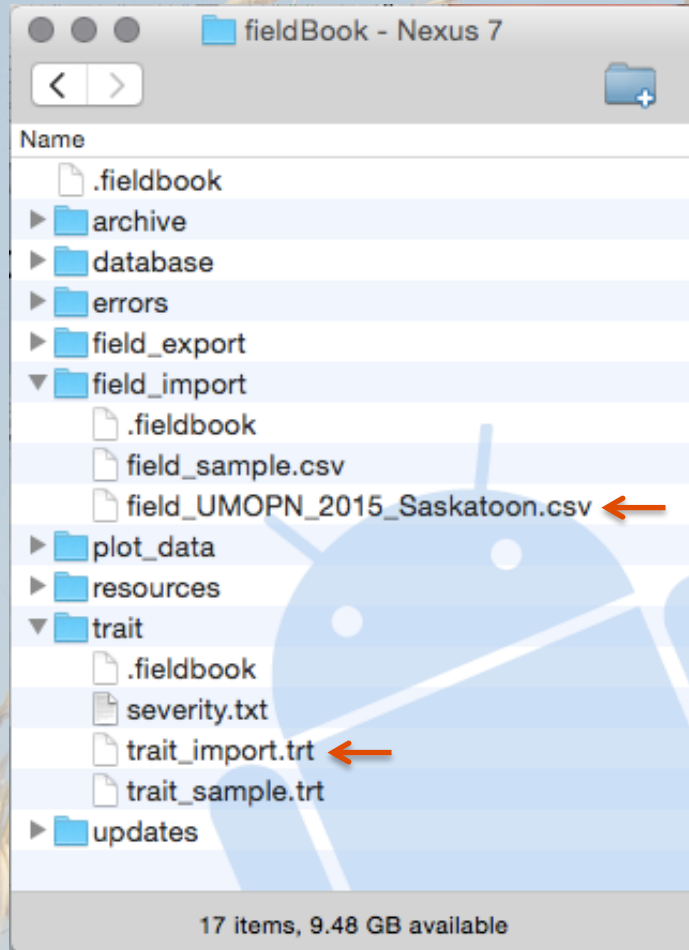
- Connect your tablet to your computer
- Move the two files downloaded from T3/Oat into the Android Field Book folder on your tablet



The Android File Transfer program for Mac (other methods of loading the files to the AFB are available)

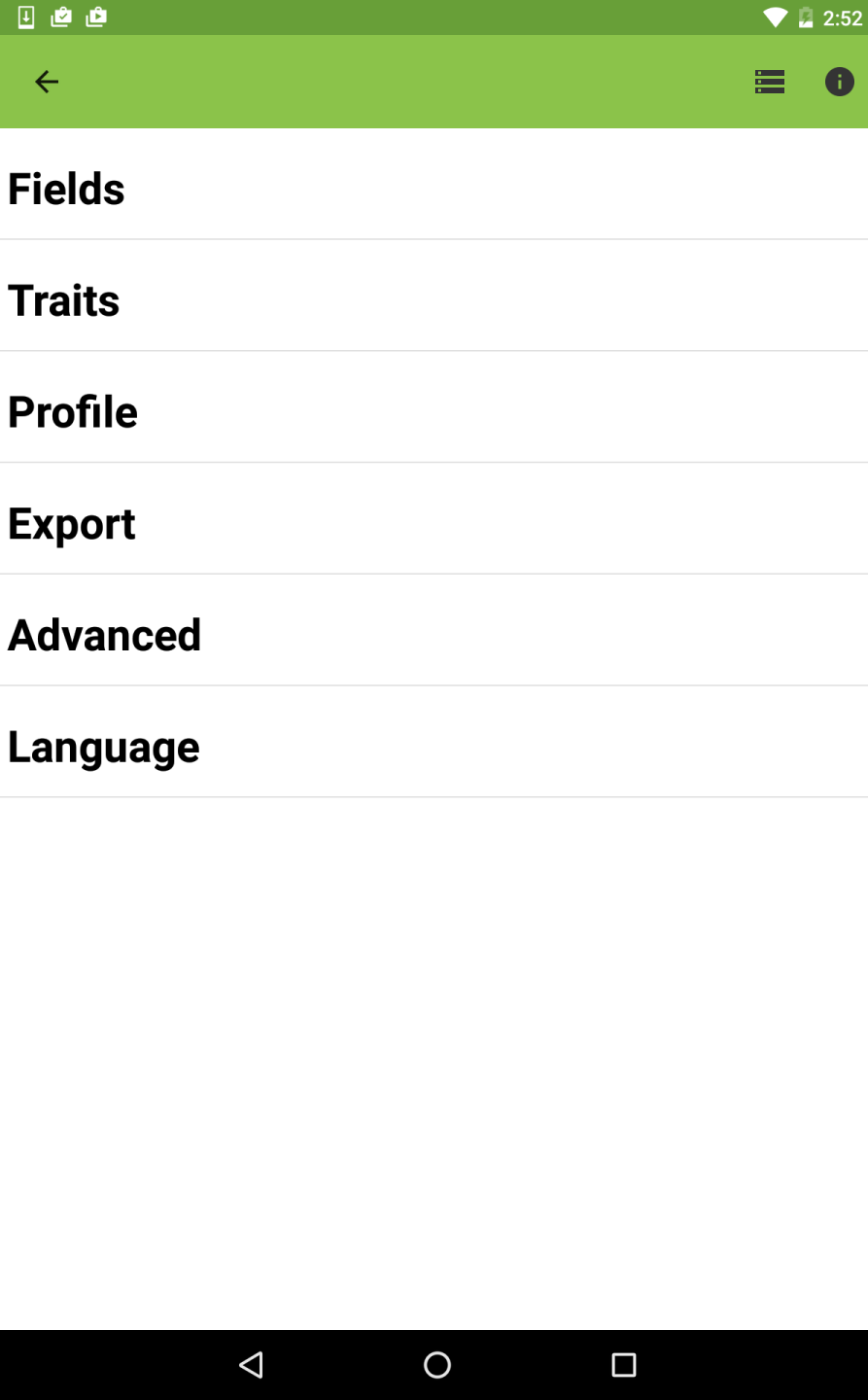
A folder containing the field layout and the file of T3 traits downloaded from T3/Oat in sections 1 & 2 of this tutorial

Section 3: Importing files to the Android Field Book



- The field layout should be placed in the folder called “field_import”
- The file of T3 traits should be placed in the folder called “trait”

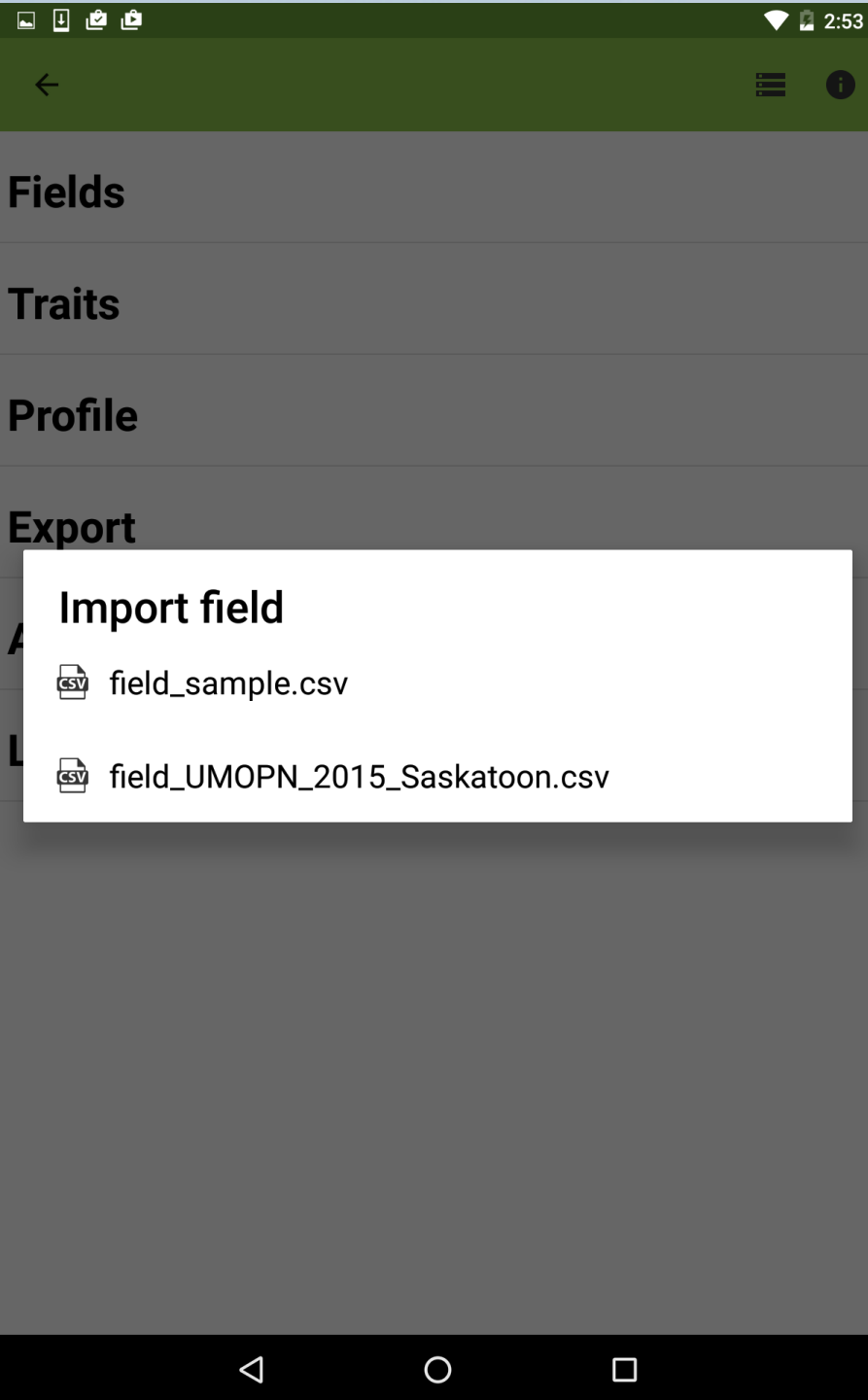
These two files enable you to begin recording results using the AFB app.



Section 3: Importing files to the Android Field Book

To begin using the AFB app you must first load the field layout and the trait file in the app

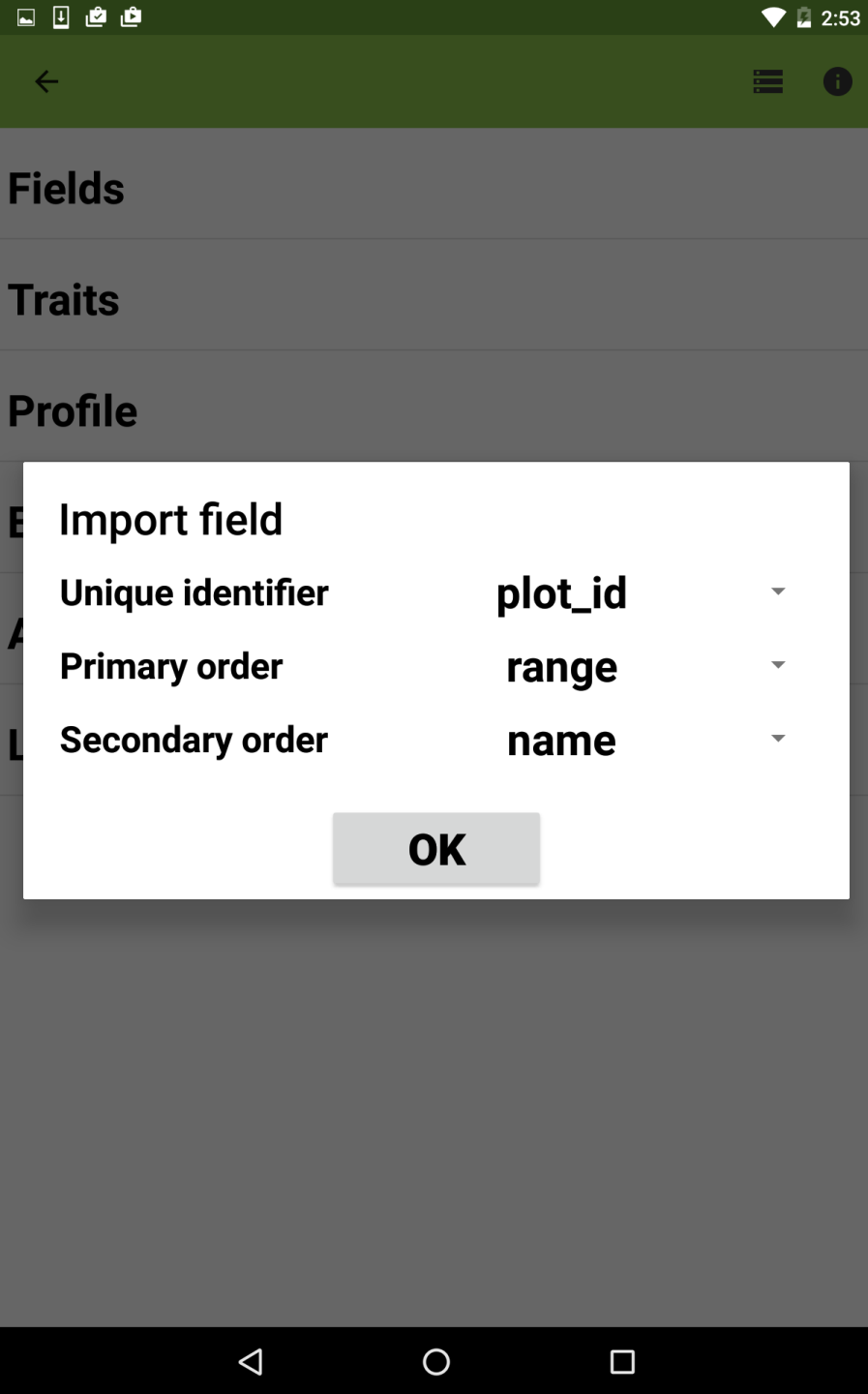
- Open the AFB app on your tablet
- Navigate to the settings menu



Section 3: Importing files to the Android Field Book

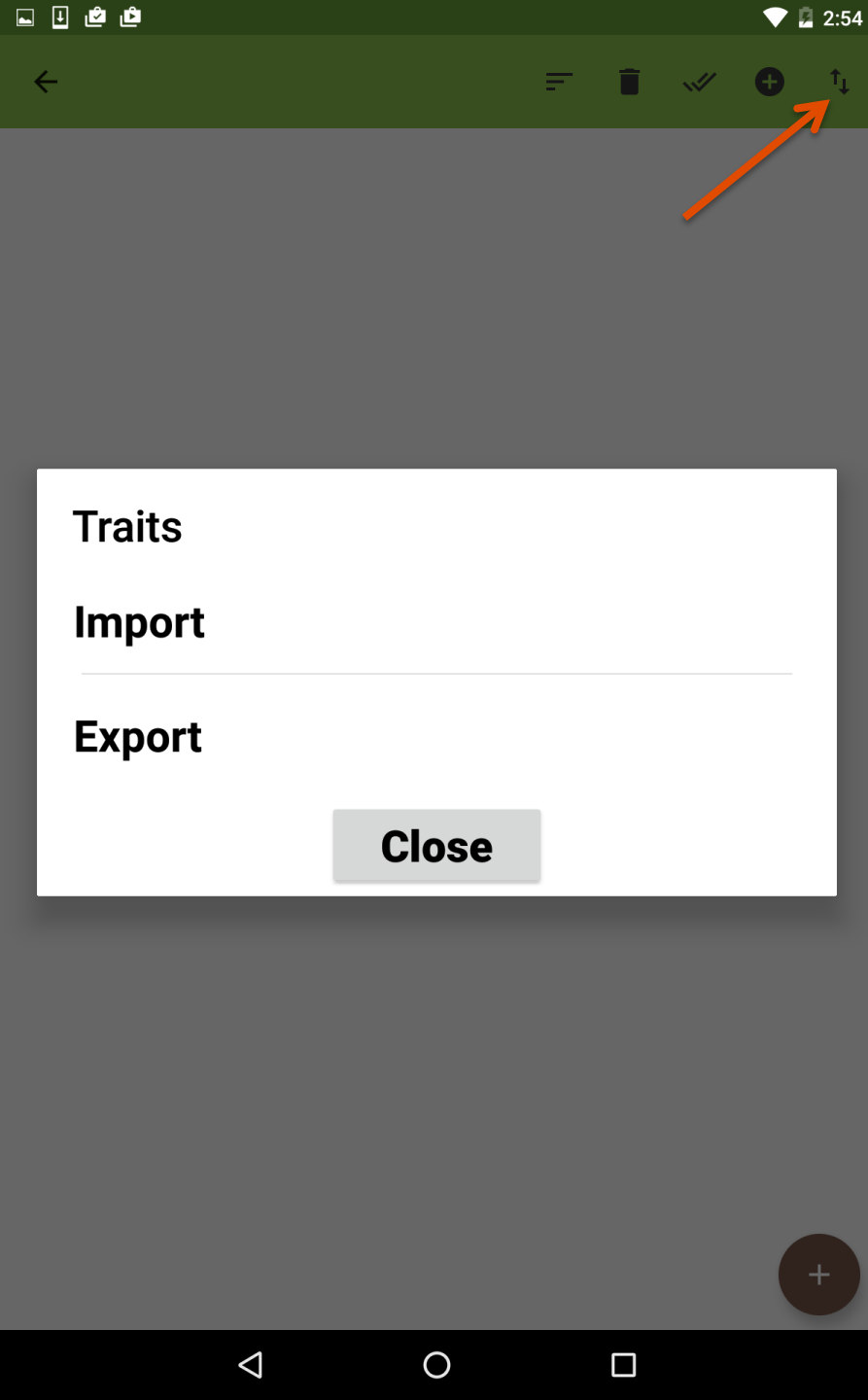
To load the field layout:

- Select “Fields” from the settings menu
- Select the relevant field layout file from the “Import field” window




Section 3: Importing files to the Android Field Book

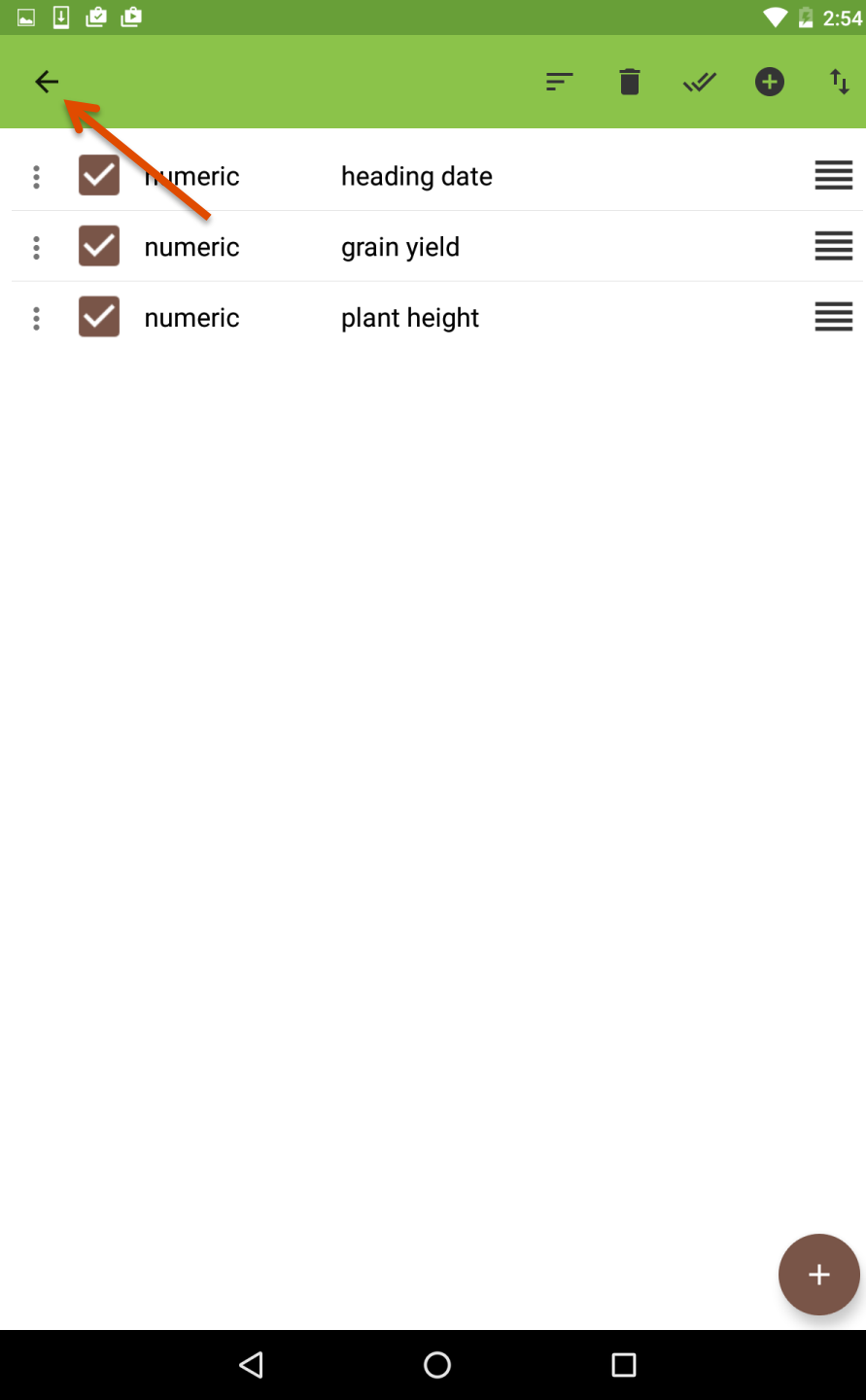
- Select the `plot_id` as the unique identifier
- Choose which fields to use for the primary and secondary order
- Click “OK”



Section 3: Importing files to the Android Field Book

To load the T3 traits:

- Select “Traits” from the settings menu
- Select the  symbol in the top right corner of the traits screen
- Choose to “Import” traits
- Select the relevant T3 trait file when prompted



Section 3: Importing files to the Android Field Book

The traits from the T3 trait import file should now be displayed in the trait window of the AFB app

- Click the back arrow ← in the top left corner of the app to reach the settings menu again
- Select the back arrow ← again to reach the data entry screen

3:05

☰ 🔍 ★ 📄 🔒

plot_id ▾ 34514_2_19

range ▾ 19

plot ▾ 101

◀ heading date ▶

Julian calendar date of heading i.e. when half of the inflorescence has emerged (Zadoks growth stage: 55). Original data recorded as the number of days to heading has been converted using the supplied planting date, which can be found in the trial information. Original values can be found in the raw data file attached to each affected trial.

◀ range: 19 name: OGLE ▶

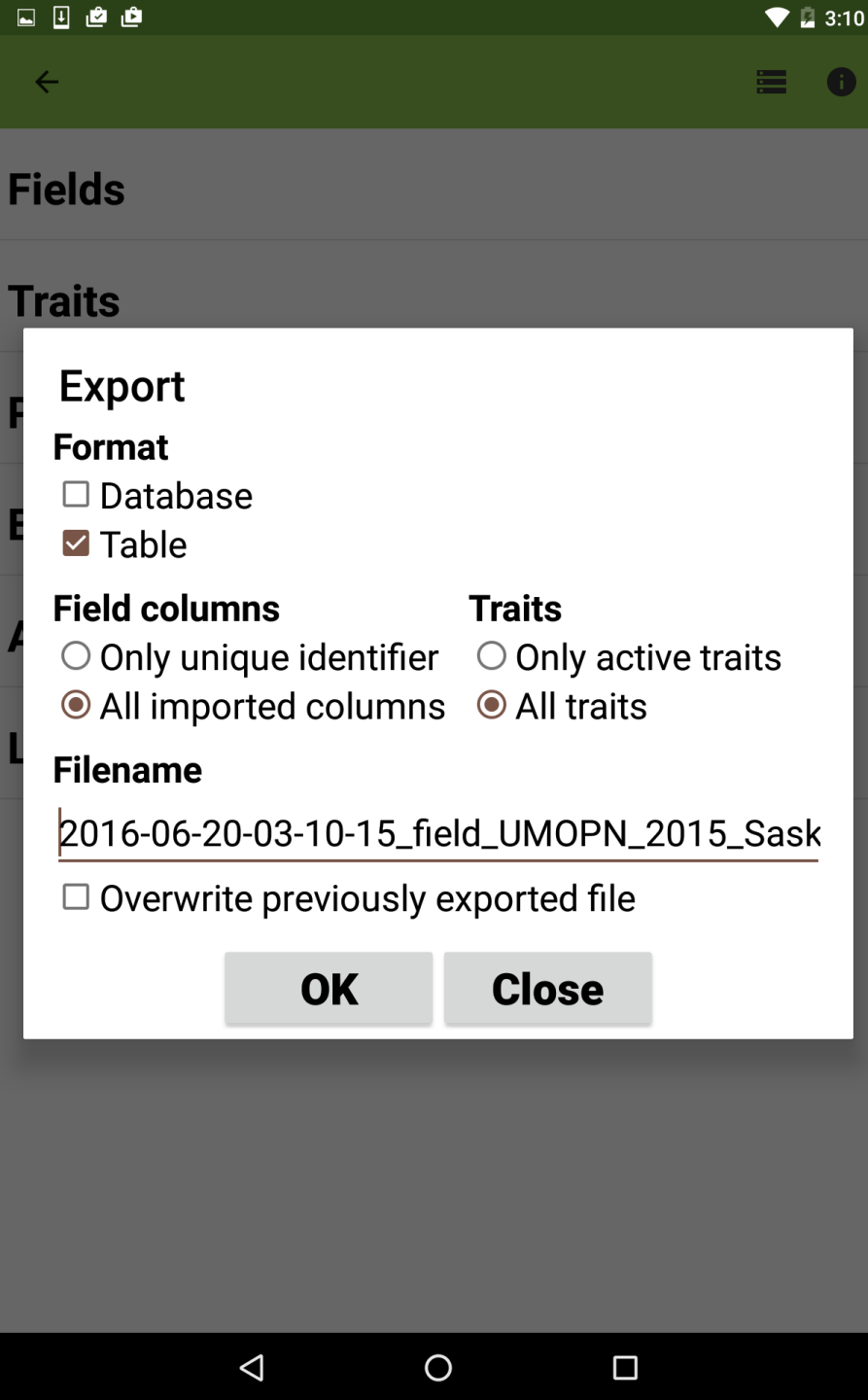
182

;	1	2	3
+	4	5	6
-	7	8	9
*	.	0	Clear

◀ ○ ▶

Section 4: Recording measurements in the Android Field Book

- The small green arrows navigate between traits
- The large black arrows navigate through the plots
- Use the keypad to record measurements

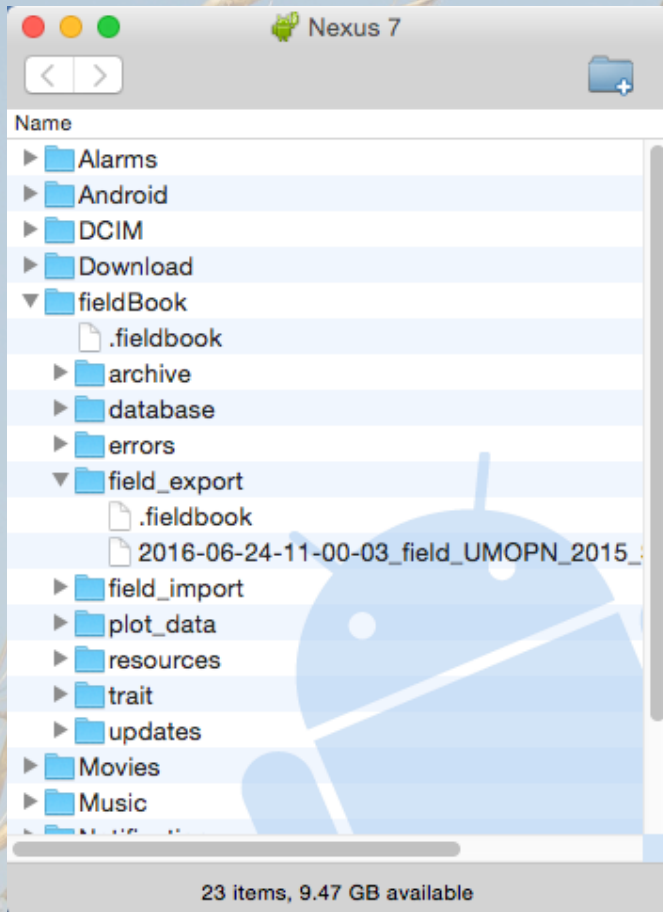


Section 5: Exporting trial results from the Android Field Book

- Navigate to the Settings menu
- Select “Export”
- Choose the “Table” format

Clicking “OK” will create a file that can be uploaded directly to T3.

Section 5: Exporting trial results from the Android Field Book



- Connect your tablet to your computer
- The exported results file will appear in the “field_export” folder within the AFB folder on your tablet
- Save the results file to your computer

The next step is to upload your results to the T3/Oat Sandbox.

The Android File Transfer
program for Mac

Section 6: Uploading Android Field Book trial results to the T3/Oat Sandbox

- Navigate to the T3/Oat Sandbox at <https://t3sandbox.org/t3/sandbox/oat/>
- The curation menu will appear once you register and login
- Choose the Curate menu> Phenotype Results

The screenshot shows the T3/Oat Sandbox website. At the top right is a "Contact Us" button. The main header "T3/Oat Sandbox" is on the left. Below it is a navigation bar with links: Home, Select, Analyze, Download, Curate, and About T3. The "Curate" link is active, and a dropdown menu is open, showing options: Lines, Pedigrees, Phenotype Trials, Phenotype Results (highlighted), CSR Data, Delete Trials and Experiments, Traits and Genetic Characters, Genotype Experiments, Genotype Results, Maps, and Markers. On the left side, there is a "Quick Links" section with "Current selections:" showing 0 Lines, 0 Markers, and 0 Traits. Below this are links for "Phenotype Trials" and "Genotype Experiments", and a "Quick search..." input field. The main content area has a "Welcome to" message and a list of names: Gabe Gusmini, Joe Lutz (Gen), Bruce Roskens, Nicholas Tinker, and Kay Simmons. To the right, there is text about the Global Oat Genetics Database, a project initiated in January 2014 by Jannink, and Gerard Lazo (USDA-ARS).

Contact Us

T3/Oat Sandbox

Home Select ▾ Analyze ▾ Download ▾ Curate ▾ About T3 ▾

Quick Links

Current selections:
Lines: 0
Markers: All
Traits: 0
[Phenotype Trials](#)
[Genotype Experiments](#)

Quick search...

What's New

Home: T3/Oat

Welcome to

T3/Oat is the repository for the T3/Oat data for the Global Oat Genetics Database, a project initiated in January 2014 by

- Gabe Gusmini
- Joe Lutz (Gen)
- Bruce Roskens
- Nicholas Tinker
- Kay Simmons,

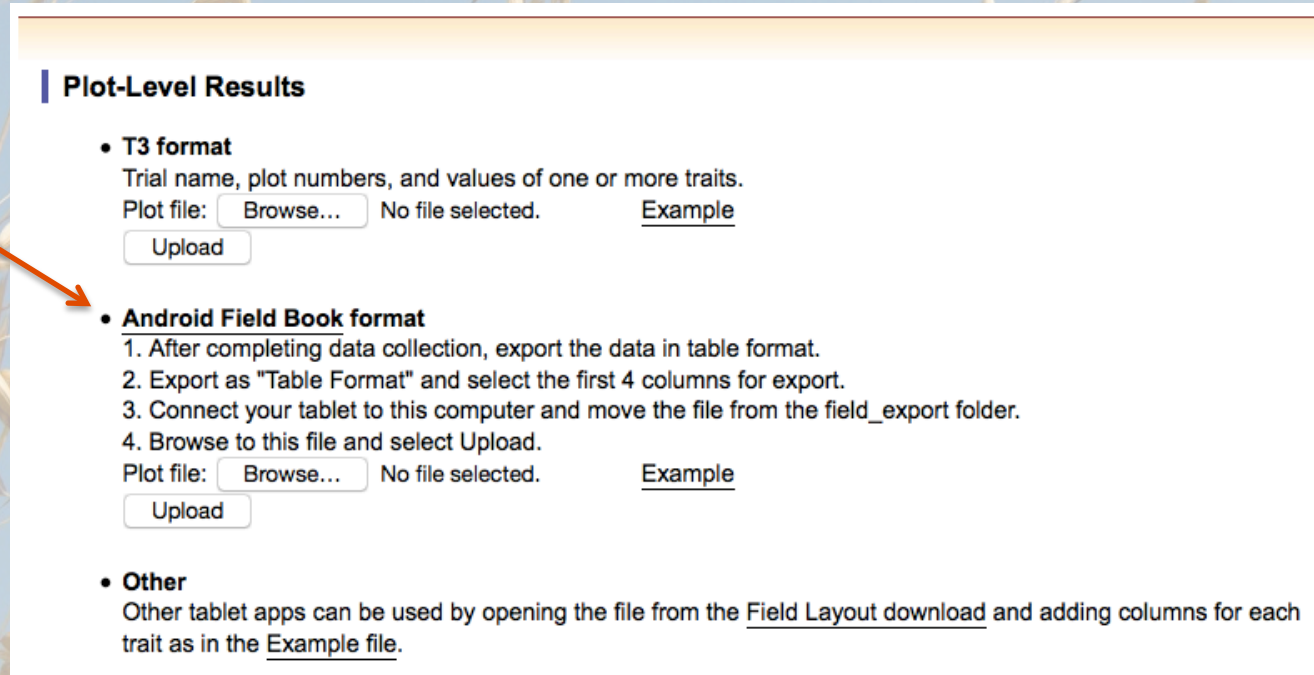
For more information, please contact the T3/Oat team.

Curate

- Lines
- Pedigrees
- Phenotype Trials
- Phenotype Results**
- CSR Data
- Delete Trials and Experiments
- Traits and Genetic Characters
- Genotype Experiments
- Genotype Results
- Maps
- Markers

Jannink, and Gerard Lazo (USDA-ARS)

Section 6: Uploading Android Field Book trial results to the T3/Oat Sandbox



Plot-Level Results

- **T3 format**
Trial name, plot numbers, and values of one or more traits.
Plot file: No file selected. [Example](#)
- **Android Field Book format**
1. After completing data collection, export the data in table format.
2. Export as "Table Format" and select the first 4 columns for export.
3. Connect your tablet to this computer and move the file from the field_export folder.
4. Browse to this file and select Upload.
Plot file: No file selected. [Example](#)
- **Other**
Other tablet apps can be used by opening the file from the [Field Layout download](#) and adding columns for each trait as in the [Example file](#).

Under the “Android Field Book format” heading, browse for and upload the plot-level results recorded using the AFB app.

Section 7: Submitting the Android Field Book trial to T3/Oat

You should be in possession of a:

1. Trial description file
2. Field layout file
3. Plot-level results file

The file of T3 traits does not need to be uploaded to T3.

The final step is to submit these three documents to the curator for upload to the T3/Oat database.



Section 7: Submitting the Android Field Book trial to T3/Oat

- Navigate to the Data Submission page from the About T3 menu
- Click the “Submit” button

The screenshot shows the T3/Oat Sandbox website. At the top, there is a navigation bar with links: Home, Select, Analyze, Download, Curate, and About T3. A red arrow points from the 'About T3' link to the 'Submit' button on the Data Submission page. The page has a header 'T3/Oat Sandbox' and a 'Contact Us' button. The main content area is titled 'Data Submission' and contains instructions for submitting data, a list of tutorials, and a search bar.

T3/Oat Sandbox [Contact Us](#)

Home Select ▾ Analyze ▾ Download ▾ Curate ▾ About T3 ▾

Quick Links

Current selections:
[Lines: 0](#)
[Markers: All](#)
[Traits: 0](#)
[Phenotype Trials](#)
[Genotype Experiments](#)

Quick search...

What's New
February 2016
Genetic Maps

Data Submission

- Data templates are Excel, .txt, or .csv worksheets with column headers for the data T3 requires or accepts.
- The example values can be replaced with your own. Notes about the restrictions for valid data are included in the templates.
- Once populated, the files can be loaded into T3 using the **Curate** menu, which is available to registered Sandbox users.
- To make updates or corrections, edit your file and reload.
- Please use the [oat Sandbox](#) database for test-loading your files. When they're ready, click here to submit them to the T3 Curator for loading into the official database.

Instructions - Rules for filling in the templates, and sequence of submission

Tutorials

- [Lesson One](#). Germplasm file creation and upload
- [Lesson Two](#). (.pdf) Phenotype trial descriptions and data
- [Lesson Three](#). Genotype trial descriptions and data
- [Lesson Four](#). How to create germplasm line panels in T3

Section 7: Submitting the Android Field Book trial to T3/Oat

Data Submission

Please submit a data file for the curator to load into the production database. File names should not contain spaces.

Data Type

- ☐ **Germplasm lines**
- ☒ **Phenotyping**
 - ☐ Experiment annotation
 - ☐ Results
- ☐ **Genotyping**
 - ☐ Experiment annotation
 - ☐ Results

Comments

This file loads successfully in the Sandbox. ☐ Yes ☒ No

☐ This file contains phenotype data private to project members only.

File: No file selected.

You can submit files that do not successfully upload to the T3/Oat Sandbox to receive help from the curator

Contact Us

Please contact us if you need help using T3/Oat

[Contact Us](#)

T3/Oat

[Home](#) [Select ▾](#) [Analyze ▾](#) [Download ▾](#) [Manage ▾](#) [About T3 ▾](#)

Quick Links

[Login/Register](#)

Current selections:

[Lines](#): 0

[Markers](#): All

[Traits](#): 0

[Phenotype Trials](#)

[Genotype Experiments](#)

Quick search...

What's New

February 2016

Genetic Maps

An expanded oat consensus map (50,668 markers) is now [available](#) in addition to the Framework Oat Consensus Map (7,202 markers) and the 12 component maps used to develop the consensus map.

Home: T3/Oat

Welcome to T3/Oat!

T3/Oat is the repository of oat phenotype and genotype data for the Global Oat Genetics Database, a project initiated in January 2014 by

- Gabe Gusmini (PepsiCo)
- Joe Lutz (General Mills)
- Bruce Roskens (Grain Millers)
- Nicholas Tinker (AAFC)
- Kay Simmons, Jack Okamuro, Jose Costa, Jean-Luc Jannink, and Gerard Lazo (USDA-ARS)

For more information see the [Oat Global](#) website.

T3/Oat is built using the database schema and software developed for [The Triticeae Toolbox](#) (T3). T3 is the web portal for wheat and barley data generated by the [Triticeae Coordinated Agricultural Project](#) (T-CAP), funded by the National Institute for Food and Agriculture ([NIFA](#)) of the US Department of Agriculture ([USDA](#)). [More...](#)

Participants: The templates and instructions for data submission are [here](#). If your data are not totally public, please check the [Data Usage Policy](#).

[Data submission](#)